

NOVEL PARTITION COMPRISING PLASTER BOARDS
WITH IMPROVED ACOUSTIC PROPERTIES

5 The invention relates to a novel partition comprising plaster boards, with improved acoustic properties.

Partitions comprising plaster boards, as well as these boards, have been known for many years. The partitions are described in particular in "Document Technique Unifié DTU 25.41"; these partitions are defined as a partition wall or wall lining, 10 which is free-standing, non-load-bearing, covering the distance from floor to ceiling. These inside walls have metal frames, generally with an approximately U-shaped profile, constituted for example by a steel sheet with a nominal thickness greater than or equal to 0.60 mm. Frames made of appropriate wood are also described. The partitions comprise upper and lower wall rails between which studs are arranged. The 15 studs can be doubled, fitted together or back-to-back. By way of example of a partition, the DTU in question mentions the partitions obtained with 48 mm studs and a single facing of boards with a thickness of 12.5 mm and the partitions obtained with 48 mm studs and a double facing of boards with a thickness of 12.5 mm.

These last two types of partition are those which are currently the most 20 common on the French market. However, these partitions pose certain problems in terms of noise transmission.

The use of glass wool or rock wool in these partitions to improve the sound proofing of these systems is known, the gain obtained being approximately 6 dB. However, these wools pose problems during their handling, as they are severe 25 irritants. Moreover, these wools pose storage problems due to their large volume.

The use of other products having an open porosity, such as polyurethane foam is also known. However, such foams are difficult to use in the case of partitions with studs and boards and are expensive compared to a solution with glass wool.

Finally, the solutions such as sandwiches (for example with expanded 30 polystyrene, optionally rendered resilient), if they are appropriate for lining, cannot be transposed to the situation of the partition with studs and boards.

This is why a need exists for a partition having acoustic properties, but which does not use these wools.

The invention allows the problems described above to be resolved.

35 The invention therefore provides a partition comprising a plurality of studs and a plurality of boards on each side, in which the unit spaces delimited by the studs and the boards are divided into 3 to 1000 volumes per m², and preferably at least 6 volumes per m².

According to one embodiment, the unit spaces are delimited by strips glued to one side of the board assembly, preferably having a thickness less than the distance between the boards, the unit spaces forming 3 to 20 volumes per m², and preferably 6 to 20 volumes per m².

5 According to another embodiment, the unit spaces are divided into 200 to 1000, and preferably 200 to 600, volumes per m².

According to yet another embodiment, the unit spaces are divided by a grid, this grid being glued at most on one side of the board assembly, having a thickness less than the distance between the boards.

10 According to another embodiment, the grid has a thickness of 70 to 98 % of the distance between the boards.

According to another embodiment, the grid is a grid in the form of a honeycomb.

According to another embodiment, the grid is made of cardboard.

15 According to another embodiment, the unit spaces are divided by a grid, this grid not being glued to the board assembly.

According to another embodiment, the boards are plaster boards.

According to another embodiment, the partition comprises upper and lower rails holding the studs and between which the grid is held.

20 According to another embodiment, the upper and lower rails comprise pre-cut tabs which can be folded back inwards and which are inserted into the grid.

The invention also provides a method for the production of a partition according to the invention, which comprises the provision of a plurality of studs and a plurality of boards, and the division of the unit spaces delimited by the studs and
25 the boards.

According to one embodiment, the method is intended for the production of a partition, in which the unit spaces are divided into 200 to 1000, and preferably 200 to 600, volumes per m², by a grid which is not glued to the board assembly according to the invention, the partition comprising upper and lower rails holding the studs and
30 between which the grid is held, in which method the grid is attached to one of the rails, the grid is extended to the other rail and it is fixed to the latter, in particular by folding back pre-cut tabs which are located in the rails in order to insert these into the grid.

The invention will now be described in more detail in the following description
35 and with reference to the drawings, in which:

- Figure 1a is a first variant of a first embodiment;
- Figure 1b is a second variant of a first embodiment;
- Figure 2 is a second embodiment;

- Figure 3 is an enlargement of a rail used in the second embodiment.

With reference to Figure 1, the partition 1 comprises a plurality of studs (2a, 2b), made of metal in this case, which support plaster boards 3. Two upper and lower rails (4a, 4b) lock the studs, in a standard fashion. Between the studs expanded polystyrene strips (5a, 5b, 5c, 5d) are arranged, wedged between the studs. These strips thus divide the unit spaces delimited by the studs and the boards. The air space (in this case 48 mm) (the distance between the boards) can be divided in several ways, for example with strips forming Zs or any other arrangement. The thickness of the strips is typically less than the thickness of the air space, for example 40 mm to 46 mm. The polystyrene strips are preferably held by wedging between the studs. However it would be possible to glue them onto one side of the boards, or even both if the thickness allows (the latter installation method not being preferred however). The strips are polystyrene strips. Other types of strip, for example metal strips or strips of material with open or sealed porosity produce the same effect. In Figures 1a and 1b, the studs are standard 48 mm metal studs at a separation of 60 cm. In Figure 1a, the strips used are 1000 x 50 x 40 strips; there are approximately 3.5 volumes to the m^2 . In Figure 1b, the strips used are 560 x 100 x 46 strips; there are approximately 6 volumes to the m^2 . The respective gains of these partitions compared to the partitions according to the prior art are of 2 and 4 dB.

With reference to Figure 2, the partition 1 comprises the same studs (2a, 2b), plaster boards 3 and upper and lower rails (4a, 4b) locking the studs. Between the studs a grid 6 is arranged, in this case in the form of a honeycomb. However, any type of grid with any unit cell, in particular an approximately oblique, approximately square, approximately rectangular or approximately hexagonal grid, would be acceptable. Advantageously a cardboard grid is used, of the type already used for internal cladding which comprise a sandwich of two boards and a cardboard honeycomb between the two. The grid extends between the upper and lower rails, between the studs. It is possible to choose a grid so that once unfolded it more or less fills the space between the studs. Such a grid compensates very well for variations in height of several dozen cms without losing its effectiveness. This grid therefore divides the unit spaces delimited by the studs and the boards. A grid having 55 mm intervals for example can be used. A cardboard grid can be easily cut, either by hand or by machine. The thickness of the grid is typically less than the thickness of the air space, for example 40 mm to 46 mm. This grid is preferably independent of the two boards (i.e. it is not glued onto either of the boards). It is advantageously "stretched" between the upper and lower rails, but it could also be stretched or compressed between the studs, or glued onto one of the boards. In Figure 2, the studs are standard 48 mm metal studs at a separation of 60 cm. The grid used has 55 mm intervals and a

thickness of 40 mm. There are approximately 500 volumes to the m^2 (number of cells of the grid to the m^2). The gain compared to the partitions according to the prior art is 5 dB.

5 The number of cells to the m^2 varies according to the inverse square of the grid intervals. The provision of any grid of cells with set intervals can be easily envisaged, for example, in the range of 40 to 100 mm, which approximately corresponds to a range of 200 to 1000 volumes to the m^2 .

10 With reference to Figure 3, the upper or lower rail (4a, 4b) has pre-cut tabs (7a, 7b) which can be folded back inwards and which are thus inserted into the grid (reference 7a shows the tab folded back while reference 7b in dotted lines shows the tab before it is folded back). With these rails equipped with these tabs, it is easy to produce partitions according to the invention. First of all the folded grid is inserted into the rail, for example the upper rail, then the tabs are folded back inwards. The result of this is to hold the grid in this rail. Then, the grid is "stretched" and
15 "unfolded" towards the other rail, and then, as previously, the tabs corresponding to this rail are folded back. Such an embodiment is very simple, robust and efficient.

However, other means for attaching the grid, such as screws, lugs or hooks could be suitable for the above embodiment.

20 At the end of a section of the grid simple stapling allows one grid to be joined to the other, therefore offcuts can be used.

Thanks to the invention, it is now possible to use filling materials which do not have an open porosity, are easy to handle, are non-irritating, have a small storage volume and are easy to handle.

25 The invention is not limited to the embodiments described but can have numerous variations which are easily accessible to a person skilled in the art. For example, the material used for the boards can be cement or plywood, as is known from the prior art. Similarly, tests have shown that it is possible to use strips made of a metal material or of a material with open or sealed porosity, rather than polystyrene, in order to divide the unit spaces delimited by the studs and the boards.

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